

(51)Int.Cl. <sup>7</sup>	識別記号	F I	テーマコード <sup>7</sup> (参考)
A61B 17/28	310	A61B 17/28	310 2H040
1/00	334	1/00	D 4C060
10/00	103	10/00	E 4C061
G02B 23/24		G02B 23/24	A

審査請求 未請求 請求項の数 1 O L (全 5 頁)

(21)出願番号 特願平11-89383

(22)出願日 平成11年3月30日(1999.3.30)

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Fターム(参考) 2H040 DA56

4C060 FF15 GG28

4C061 AA00 BB00 CC00 DD03 GG15

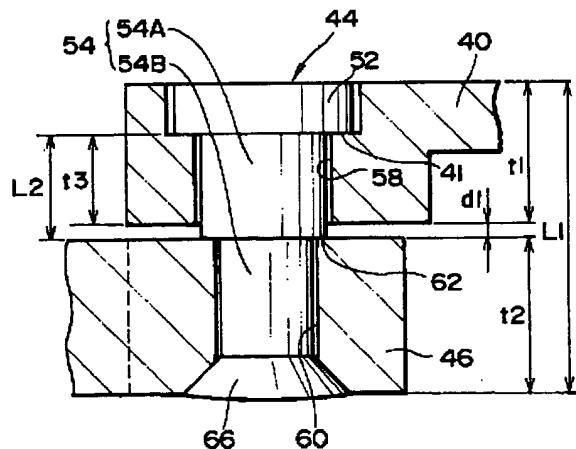
HH56 JJ06 JJ11

## (54)【発明の名称】内視鏡用処置具

## (57)【要約】

【課題】本発明は、鉗子部16におけるリンク40と鉗子片46との間に所定の隙間を形成することにより、リンク40と鉗子片46との回動操作性を向上させ、ラッピング加工等の2次加工を不要にする内視鏡用処置具を提供する。

【解決手段】本発明の生検鉗子10は、鉗子部16に配設されるリンク40と鉗子片46とがピン44により回動自在に連結される。ピンの長さL1は、リンク40と鉗子片46とを重ね合わせた長さt1+t2よりも長く形成される。また、ピン44の軸部54には、外周面に段部62が形成され、この段部62が鉗子片46に当接される。これにより、前記鉗子片46の位置が規制され、リンク40と鉗子片46との間に所定の隙間d1が形成される。



## 【特許請求の範囲】

【請求項1】挿入部先端に軸支された一対の鉗子片と、該一対の鉗子片の後端に軸支された一対のリンクと、該一対のリンクの後端に軸支されたスライダと、を備え、手元操作部を操作して前記スライダを前後動させ、前記一対の鉗子片を開閉させる内視鏡用処置具において、前記鉗子片の後端とリンクとは段付き形状のピンを介して軸支されるとともに、前記ピンは前記鉗子片とリンクとを重ねた厚さよりも長く形成され、該ピンの段部によって前記鉗子片の後端とリンクとは所定の隙間をもって連結されることを特徴とする内視鏡用処置具。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、内視鏡の鉗子孔から挿入されて使用される生検鉗子、把持鉗子等の内視鏡用処置具に関する。

## 【0002】

【従来の技術】生検鉗子、把持鉗子等の鉗子は、内視鏡の鉗子孔から挿入されて使用され、鉗子の手元操作部を操作することにより、一対の鉗子片が開閉操作される。この鉗子片は、複数のリンクからなるリンク機構によって開閉動作される。前記リンク機構のリンクと鉗子片とを連結するピンは、リンク及び鉗子片に形成されたピン挿入孔に挿入された後、かしめ加工されて鉗子片及びリンクに取り付けられる。この状態において、リンクと鉗子片は密着されているので回動操作性が悪く、このため、従来の鉗子は、かしめ加工後に鉗子片とリンクとの間にダイヤモンドペーストを注入し、鉗子片とリンクとの密着面をラッピング加工して鉗子片とリンク間に隙間を持たせることにより、回動操作性を向上させていた。

## 【0003】

【発明が解決しようとする課題】しかしながら、前記従来の鉗子は、ピンのかしめ加工後にラッピング加工を行う必要があるので、鉗子の組み立てに手間がかかるという欠点があった。本発明はこのような事情に鑑みてなされたもので、手間をかけずに組み立てができる内視鏡用処置具を提供することを目的とする。

## 【0004】

【課題を解決するための手段】本発明は前記目的を達成するために、挿入部先端に軸支された一対の鉗子片と、該一対の鉗子片の後端に軸支された一対のリンクと、該一対のリンクの後端に軸支されたスライダと、を備え、手元操作部を操作して前記スライダを前後動させ、前記一対の鉗子片を開閉させる内視鏡用処置具において、前記鉗子片の後端とリンクとは段付き形状のピンを介して軸支されるとともに、前記ピンは前記鉗子片とリンクとを重ねた厚さよりも長く形成され、該ピンの段部によって前記鉗子片の後端とリンクとは所定の隙間をもって連結されることを特徴とする。

## 【0005】本発明によれば、鉗子片の後端とリンクと

の間には所定の隙間が形成されているので、前記鉗子片とリンクとはスムーズに回動操作される。したがって、ラッピング加工等の2次加工が不要になり、手間をかけずに鉗子片とリンクとを連結することができる。

## 【0006】

【発明の実施の形態】以下添付図面に従って本発明に係る内視鏡用処置具の好ましい実施の形態について詳説する。図1は、本発明の内視鏡用処置具が適用された生検鉗子10の正面図である。同図に示す生検鉗子10は、術者が操作時に使用する手元操作部12、内視鏡の鉗子孔等に挿入される挿入部14、及び鉗子部(先端部)16から構成されている。

【0007】前記手元操作部12には軸状体18が設けられ、この軸状体18は、筒状に形成された操作子20に摺動自在に挿入されている。前記操作子20の、上下端部にはフランジ22、24が形成されており、前記操作子20の内部には、半径方向にビス(図示せず)が設けられ、このビスは軸状体18内に摺動自在に配置されたスライダ(図示せず)にねじ込まれている。これによって、操作子20とスライダとが一体に連結されている。前記スライダには、操作ワイヤ26の基端部が固定され、この操作ワイヤ26の先端部は鉗子部16に連結されている。

【0008】前記軸状体18の上端部には、リング状の指掛け部28が形成されている。この指掛け部28には、操作時において、術者の親指が挿通され、この状態で人指し指と中指を操作子20のフランジ22とフランジ24との間に挿入した後、操作子20が押し引き操作されるようになっている。操作子20が操作されると、前記スライダ及び操作ワイヤ26を介して連結された前記鉗子部16が作動される。

【0009】前記手元操作部12は、その外周部が可撓性を有する密着コイルばね30で形成されている。この密着コイルばね30の基端部は、前記軸状体18の下端部に固着されている。密着コイルばね30の内部には、前記操作ワイヤ26が挿通され、密着コイルばね30の先端部は、鉗子部16を構成する略筒状に形成された鉗子部本体32に接合されている。

【0010】前記鉗子部16は図2及び図3に示すように、操作ワイヤ26の先端部に連結されるスライダ34を備え、このスライダ34にはピン36を介してリンク38、40が回動自在に支持されている。このリンク38、40の他端には略くの字状に形成された鉗子片46、48がピン42、44を介して連結されている。前記鉗子片46、48は、その重なり部において、軸50を介して鉗子部本体32に軸支されている。したがって、前記鉗子部16の鉗子片46、48は、図1の操作子20が上下移動され、操作ワイヤ26が押し込み、又は引き込み操作されることにより、ピン50を中心に互いに逆方向に回動され、開閉操作される。

【0011】前記ピン44は、図4に示すように、軸部54と、該軸部54の端部に設けられたフランジ52から構成される。前記軸部54は、大径部54Aと小径部54Bとからなり、軸部54の外周面には、段部62が形成される。この軸部54は、小径部54Bが鉗子片46に形成されたピン挿入孔60に挿入され、大径部54Aがリンク40に形成されたピン挿入孔58に挿入されるとともに、前記段部62が鉗子片46に当接して、鉗子片46の位置が規制される。

【0012】また、前記ピン44は、その長さL1がリンク40と鉗子片46を重ねた厚さt1+t2よりもd1だけ長く形成される。具体的には、大径部54Aの長さL2が、リンク40のピン挿入孔58の長さt3よりもd1だけ長く形成されている。これにより、リンク40と鉗子片46との間には所定の隙間d1=L1-(t1+t2)が形成される。ここで所定の隙間d1とは、リンク40と鉗子片46とを回動させるために適切な隙間であり、本実施例では、約0.02~0.05mmに設定される。

【0013】次に上記の如く構成された生検鉗子10の作用について説明する。リンク40と鉗子片46とは、ピン44をかしめ加工することにより連結される。即ち、前記ピン44の軸部54をリンク40、46のピン挿入孔58、60に挿入し、ピン44のフランジ52をリンク40の座41に当接させ、ピン44をかしめてピン44の端部を塑性変形させて図4のかしめ部66を形成する。このかしめ加工により、鉗子片46は、段部62とかしめ部66に挿着され、リンク40は、挿着された鉗子片46と所定の隙間を介してピン44により回動自在に連結される。

【0014】このとき、リンク40と鉗子片46との隙間が小さ過ぎると、リンク40と鉗子片46とが密着して回動しにくくなる。逆にリンク40と鉗子片46との隙間が大き過ぎると、リンク40と鉗子片46との回動はしやすいが、リンク40と鉗子片46との間にガタツキが生じる。これに対し、本実施例では、リンク40と鉗子片46との間に適切な大きさの隙間が形成されているので、かしめ加工後のリンク40と鉗子片46との回動操作性がよい。

【0015】このように、本実施の形態の生検鉗子10によれば、リンク40と鉗子片46との間に所定の隙間を設けたので、かしめ加工後のリンク40と鉗子片46

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との回動操作性が良く、リンク40と鉗子片46との操作性を向上させるための2次加工が不要になる。したがって、リンク40と鉗子片46とを手間をかけずに連結することができる。

【0016】以上は、リンク40と鉗子片46との連結構造とその作用についての説明であるが、ピン42におけるリンク38と鉗子片48との連結構造も、前記連結構造と同様に構成することにより、手間をかけずに連結することができる。また、リンク38、40とスライダ34との連結構造も前述した連結構造と同様に構成するとよい。例えば、図5に示すようにピン36の軸部72の長さL3を、リンク38、40とスライダ34を重ねた厚さt4+t5+t6よりも長く形成する。また、ピン36の軸部72に段部70を形成し、この段部70をリンク38に当接させ、リンク38の位置を規制する。そして、ピン36をかしめてかしめ部68を形成し、リンク38とスライダ34との間に所定の隙間d2=L3-(t4+t5+t6)を形成する。これにより、スライダ34に対するリンク38、40の回動操作性が向上する。

【0017】なお、上述した実施の形態では生検鉗子10を例示したが、これに限られるものではなく、ピンにより回動自在に連結されるリンクが用いられる内視鏡用処置具であれば適用することができる。

#### 【0018】

【発明の効果】以上説明したように、本発明の内視鏡用処置具によれば、段付き形状のピンによってリンクと鉗子片とを所定の隙間を設けて連結したので、ラッピング加工等の2次加工が不要になり、手間をかけずにリンクと鉗子片とを連結して処置具を組み立てることができ

る。

#### 【図面の簡単な説明】

【図1】本実施の形態の生検鉗子の全体図

【図2】図1に示した生検鉗子の鉗子部の縦断面図

【図3】図2に示した鉗子部の3-3線に沿う断面図

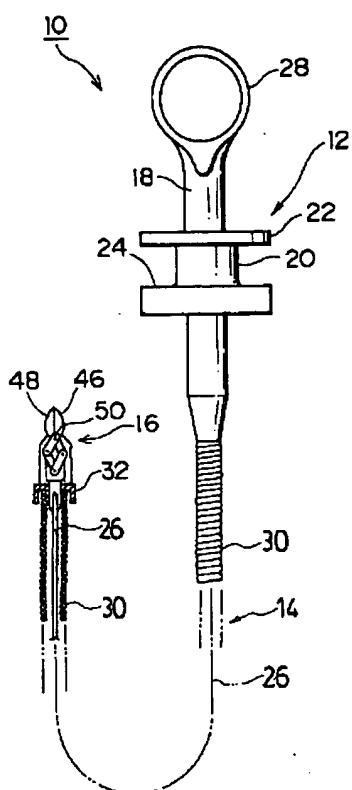
【図4】図3に示したピンの部分拡大図

【図5】他の実施例を示す説明図

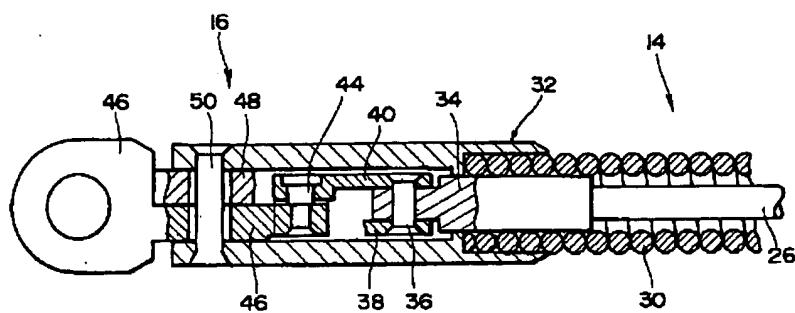
#### 【符号の説明】

10…生検鉗子、16…鉗子部、38…リンク、40…リンク、42…ピン、44…ピン、46…鉗子片、48…鉗子片、52…フランジ、54…軸部、62…段部

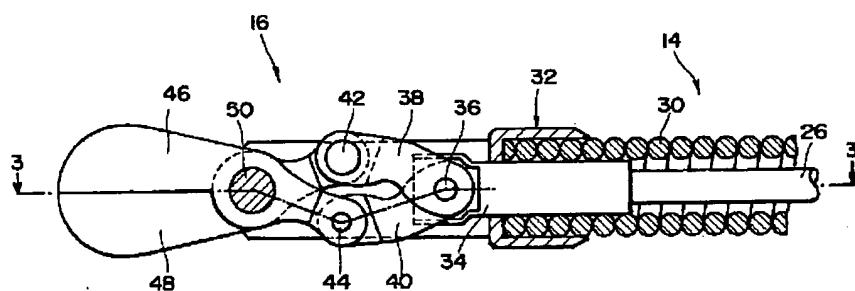
【図1】



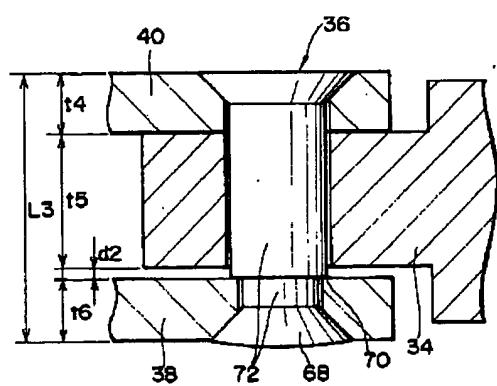
【図3】



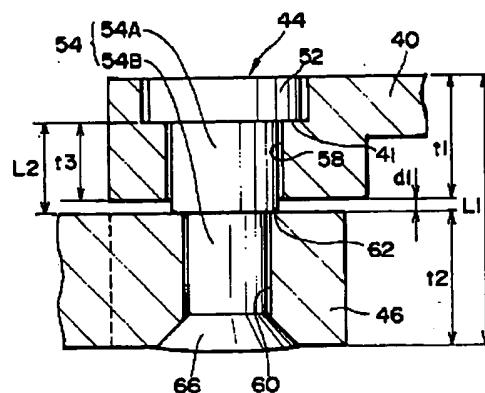
【図2】



【図5】



【図4】



# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-279421

(43)Date of publication of application : 10.10.2000

(51)Int.Cl.

A61B 17/28

A61B 1/00

A61B 10/00

G02B 23/24

(21)Application number : 11-089383

(71)Applicant : FUJI PHOTO OPTICAL CO LTD

(22)Date of filing : 30.03.1999

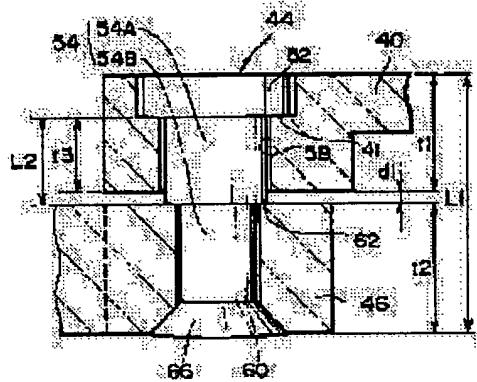
(72)Inventor : MACHIDA MITSUNORI

## (54) ENDOSCOPE TREATMENT IMPLEMENT

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an endoscope treatment implement by which rotation operability in a link and a forceps piece is improved and a secondary work such as wrapping work isunnecessary by forming a prescribed gap between the link and the forceps piece in a forceps part.

**SOLUTION:** In biopsy forceps, the link 40 and the forceps piece 46 arranged in the forceps part are connected by a pin 44 so as to be freely rotatable. The pin is formed to have its length L1 which is longer than the one t1 plus t2 obtained by superimposing the link 40 and the forceps piece 46. Besides, a step part 62 is formed on an outer peripheral surface in the shaft part 54 of the pin 44 and is abutted on the forceps piece 46. Thus, the position of the piece 46 is restricted and the prescribed gap d1 is formed between the link 40 and the piece 46.



### LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

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[Claim(s)]

[Claim 1] The link of the couple supported to revolve by the back end of the piece of forceps of the couple supported to revolve at the nose of cam of the insertion section, and the piece of forceps of this couple, In the disposal implement for endoscopes which it has the slider supported to revolve by the back end of the link of this couple, and a hand control unit is operated [ implement ], carries out longitudinal slide movement of the aforementioned slider, and makes the piece of forceps of the aforementioned couple open and close While the back end and the link of the aforementioned piece of forceps are supported to revolve through the pin of a configuration with the stage The aforementioned pin is a disposal implement for endoscopes which is formed for a long time than the thickness which repeated the aforementioned piece of forceps, and the link, and is characterized by connecting the back end and the link of the aforementioned piece of forceps with a predetermined crevice by the step of this pin.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[The technical field to which invention belongs] this invention — the forceps of an endoscope — it is related with disposal implements for endoscopes used from a hole, being inserted, such as a bioptome and grasping forceps

#### [0002]

[Description of the Prior Art] forceps, such as a bioptome and grasping forceps, — the forceps of an endoscope — it is used from a hole, being inserted and switching operation of the piece of forceps of a couple is carried out by operating the hand control unit of forceps. Switching action of this piece of forceps is carried out by the link mechanism which consists of two or more links. the pin insertion to which the pin which connects the link and the piece of forceps of the aforementioned link mechanism was formed in the link and the piece of forceps — after being inserted in a hole, it is caulked and is attached in the piece of forceps, and a link. In this state, since it was stuck to the link and the piece of forceps, its rotation operability was bad, for this reason, the conventional forceps poured in diamond paste between the piece of forceps, and the link after caulking, and rotation operability was raised by carrying out wrapping processing of the faying surface of the piece of forceps, and a link, and giving a crevice between the piece of forceps, and a link.

#### [0003]

[Problem(s) to be Solved by the Invention] However, since the aforementioned conventional forceps needed to perform wrapping processing after caulking of a pin, they had the fault that the assembly of forceps took time and effort. this invention was not made in view of such a situation, and aims at offering the disposal implement for endoscopes which can be assembled without applying time and effort.

#### [0004]

[Means for Solving the Problem] The piece of forceps of the couple supported to revolve at the nose of cam of the insertion section in order that this invention might attain the aforementioned purpose, In the disposal implement for endoscopes which it has the slider supported to revolve by the back end of the link of the couple supported to revolve by the back end of the piece of forceps of this couple, and the link of this couple, and a hand control unit is operated [ implement ], carries out longitudinal slide movement of the aforementioned slider, and makes the piece of forceps of the aforementioned couple open and close. The aforementioned pin is formed for a long time than the thickness which repeated the aforementioned piece of forceps, and the link, and the back end and the link of the aforementioned piece of forceps are characterized by being connected with a predetermined crevice by the back end and the link of the aforementioned piece of forceps by the step of this pin while they are supported to revolve through the pin of a configuration with the stage.

[0005] According to this invention, since the predetermined crevice is formed between the back end of the piece of forceps, and the link, rotation operation of the aforementioned piece of forceps and the link is carried out smoothly. Therefore, secondary elaboration, such as wrapping processing, becomes unnecessary and the piece of forceps and a link can be connected, without

applying time and effort.

[0006]

[Embodiments of the Invention] It explains in full detail about the gestalt of desirable operation of the disposal implement for endoscopes which starts this invention according to an accompanying drawing below. Drawing 1 is the front view of the bioptome 10 with which the disposal implement for endoscopes of this invention was applied. the forceps of the hand control unit 12 and endoscope with which a way person uses the bioptome 10 shown in this drawing at the time of operation — it consists of the insertion section 14 inserted in a hole etc., and the forceps section (point) 16

[0007] A stem 18 is formed in the aforementioned hand control unit 12, and this stem 18 is inserted in the handler 20 formed in tubed free [ sliding ]. Flanges 22 and 24 are formed in the vertical edge of the aforementioned handler 20, inside the aforementioned handler 20, a screw (not shown) is prepared in radial, and this screw is thrust into the slider (not shown) arranged free [ sliding in a stem 18 ]. The handler 20 and the slider are connected with one by this. The end face section of the operation wire 26 is fixed to the aforementioned slider, and the point of this operation wire 26 is connected with the forceps section 16.

[0008] The ring-like fingerplate section 28 is formed in the upper-limit section of the aforementioned stem 18. After inserting in a way person's thumb at the time of operation and inserting \*\*\*\*\* and the middle finger between the flange 22 of a handler 20, and a flange 24 in this state, a handler 20 pushes and length operation is carried out at this fingerplate section 28. Operation of a handler 20 operates the aforementioned forceps section 16 connected through the aforementioned slider and the operation wire 26.

[0009] The aforementioned hand control unit 12 is formed with the adhesion coiled spring 30 with which the periphery section has flexibility. The end face section of this adhesion coiled spring 30 has fixed in the soffit section of the aforementioned stem 18. The aforementioned operation wire 26 is inserted in the interior of the adhesion coiled spring 30, and the point of the adhesion coiled spring 30 is joined to the forceps section main part 32 formed in the abbreviation tubed which constitutes the forceps section 16.

[0010] As the aforementioned forceps section 16 is shown in drawing 2 and drawing 3, it has the slider 34 connected with the point of the operation wire 26, and links 38 and 40 are supported by this slider 34 free [ rotation ] through the pin 36. The pieces 46 and 48 of forceps formed in rough-elbowed are connected with the other end of these links 38 and 40 through pins 42 and 44. The aforementioned pieces 46 and 48 of forceps are supported to revolve by the forceps section main part 32 through the shaft 50 in the lap section. Therefore, switching operation of the pieces 46 and 48 of forceps of the aforementioned forceps section 16 is mutually rotated and carried out to an opposite direction a center [ a pin 50 ] by carrying out vertical movement of the handler 20 of drawing 1, and the operation wire's 26 pushing in or drawing-in operation being carried out.

[0011] The aforementioned pin 44 consists of flanges 52 prepared in the shank 54 and the edge of this shank 54, as shown in drawing 4. The aforementioned shank 54 consists of major-diameter section 54A and narrow diameter portion 54B, and a step 62 is formed in the peripheral face of a shank 54. the pin insertion to which, as for this shank 54, narrow diameter portion 54B was formed in the piece 46 of forceps — the pin insertion to which it was inserted in the hole 60 and major-diameter section 54A was formed in the link 40 — while being inserted in a hole 58, the aforementioned step 62 contacts the piece 46 of forceps, and the position of the piece 46 of forceps is regulated

[0012] Moreover, only d 1 is formed for a long time rather than thickness t1+t2 on which, as for the aforementioned pin 44, the length L1 put the link 40 and the piece 46 of forceps. concrete — the length L2 of major-diameter section 54A — pin insertion of a link 40 — only d 1 is formed for a long time rather than the length t3 of a hole 58 Thereby, between a link 40 and the piece 46 of forceps, predetermined crevice d1=L1-(t1+t2) is formed. The here predetermined crevice d1 is a suitable crevice in order to rotate a link 40 and the piece 46 of forceps, and in this example, it is set as about 0.02–0.05mm.

[0013] Next, an operation of the constituted bioptome 10 is explained like the above. A link 40

and the piece 46 of forceps are connected by caulking a pin 44, namely, the shank 54 of the aforementioned pin 44 — pin insertion of links 40 and 46 — insert in holes 58 and 60, make the flange 52 of a pin 44 contact the seat 41 of a link 40, the edge of a pin 44 is made to deform a pin 44 plastically in total, and the caulking section 66 of drawing 4 is formed It is connected free [ rotation by the pin 44 ] by this caulking through the crevic between a step 62, or predetermined [ the piece 46 of forceps to which the link 40 was fastened by closing and being fastened to the section 66 and predetermined ] in the piece 46 of forceps.

[0014] If the crevice between a link 40 and the piece 46 of forceps is too small at this time, a link 40 and the piece 46 of forceps will stick, and it will be hard coming to rotate. Conversely, if the crevice between a link 40 and the piece 46 of forceps is too large, a backlash will produc [ a plain-gauze cone ] rotation with a link 40 and the piece 46 of forceps between a link 40 and the piece 46 of forceps. On the other hand, in this example, since the crevice between sizes suitable between a link 40 and the piece 46 of forceps is formed, the rotation operability of the link 40 after caulking and the piece 46 of forceps is good.

[0015] Thus, according to the bioptome 10 of the gestalt of this operation, since the predetermined crevice was prepared between the link 40 and the piece 46 of forceps, the rotation operability of the link 40 after caulking and the piece 46 of forceps is good, and the secondary elaboration for raising the operability of a link 40 and the piece 46 of forceps becomes unnecessary. Therefore, a link 40 and the piece 46 of forceps can be connected, without applying time and effort.

[0016] Although the above is the connection structure of a link 40 and the piece 46 of forceps, and explanation about the operation, the connection structure of the link 38 and the piece 48 of forceps in a pin 42 can also be connected by constituting like the aforementioned connection structure, without applying time and effort. Moreover, it is good to constitute like the connection structure which also mentioned above the connection structure of links 38 and 40 and a slider 34. For example, as shown in drawing 5, the length L3 of the shank 72 of a pin 36 is formed for a long time than thickness  $t_4+t_5+t_6$  which piled up links 38 and 40 and the slider 34. Moreover, form a step 70 in the shank 72 of a pin 36, this step 70 is made to contact a link 38, and the position of a link 38 is regulated. And the caulking section 68 is formed for a pin 36 in total, and predetermined crevice  $d_2=L_3-(t_4+t_5+t_6)$  is formed between a link 38 and a slider 34. Thereby, the rotation operability of the links 38 and 40 to a slider 34 improves.

[0017] In addition, although the bioptome 10 was illustrated with the gestalt of operation mentioned above, it is not restricted to this, and it is applicable if it is the disposal implement for endoscopes with which the link connected free [ rotation ] by the pin is used.

[0018]

[Effect of the Invention] Since according to the disposal implement for endoscopes of this invention the predetermined crevice was prepared and the link and the piece of forceps were connected by the pin of a configuration with the stage as explained above, secondary elaboration, such as wrapping processing, can become unnecessary, can connect a link and the piece of forceps, without applying time and effort, and can assemble a disposal implement.

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**TECHNICAL FIELD**

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[The technical field to which invention belongs] this invention — the forceps of an endoscope — it is related with disposal implements for endoscopes used from a hole, being inserted, such as a bioptome and grasping forceps

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PRIOR ART

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[Description of the Prior Art] forceps, such as a bioptome and grasping forceps, — the forceps of an endoscope — it is used from a hole, being inserted and switching operation of the piece of forceps of a couple is carried out by operating the hand control unit of forceps. Switching action of this piece of forceps is carried out by the link mechanism which consists of two or more links. the pin insertion to which the pin which connects the link and the piece of forceps of the aforementioned link mechanism was formed in the link and the piece of forceps — after being inserted in a hole; it is caulked and is attached in the piece of forceps, and a link. In this state, since it was stuck to the link and the piece of forceps, its rotation operability was bad, for this reason, the conventional forceps poured in diamond paste between the piece of forceps, and the link after caulking, and rotation operability was raised by carrying out wrapping processing of the faying surface of the piece of forceps, and a link, and giving a crevice between the piece of forceps, and a link.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention] Since according to the disposal implement for endoscopes of this invention the predetermined crevice was prepared and the link and the piece of forceps were connected by the pin of a configuration with the stage as explained above, secondary elaboration, such as wrapping processing, can become unnecessary, can connect a link and the piece of forceps, without applying time and effort, and can assemble a disposal implement.

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**TECHNICAL PROBLEM**

[Problem(s) to be Solved by the Invention] However, since the aforementioned conventional forceps needed to perform wrapping processing after caulking of a pin, they had the fault that the assembly of forceps took time and effort. this invention was not made in view of such a situation, and aims at offering the disposal implement for endoscopes which can be assembled without applying time and effort.

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## MEANS

[Means for Solving the Problem] The piece of forceps of the couple supported to revolve at the nose of cam of the insertion section in order that this invention might attain the aforementioned purpose, In the disposal implement for endoscopes which it has the slider supported to revolve by the back end of the link of the couple supported to revolve by the back end of the piece of forceps of this couple, and the link of this couple, and a hand control unit is operated [ implement ], carries out longitudinal slide movement of the aforementioned slider, and makes the piece of forceps of the aforementioned couple open and close The aforementioned pin is formed for a long time than the thickness which repeated the aforementioned piece of forceps, and the link, and the back end and the link of the aforementioned piece of forceps are characterized by being connected with a predetermined crevice by the back end and the link of the aforementioned piece of forceps by the step of this pin while they are supported to revolve through the pin of a configuration with the stage.

[0005] According to this invention, since the predetermined crevice is formed between the back end of the piece of forceps, and the link, rotation operation of the aforementioned piece of forceps and the link is carried out smoothly. Therefore, secondary elaboration, such as wrapping processing, becomes unnecessary and the piece of forceps and a link can be connected, without applying time and effort.

[0006]

[Embodiments of the Invention] It explains in full detail about the gestalt of desirable operation of the disposal implement for endoscopes which starts this invention according to an accompanying drawing below. Drawing 1 is the front view of the bioptome 10 with which the disposal implement for endoscopes of this invention was applied. the forceps of the hand control unit 12 and endoscope with which a way person uses the bioptome 10 shown in this drawing at the time of operation — it consists of the insertion section 14 inserted in a hole etc., and the forceps section (point) 16

[0007] A stem 18 is formed in the aforementioned hand control unit 12, and this stem 18 is inserted in the handler 20 formed in tubed free [ sliding ]. Flanges 22 and 24 are formed in the vertical edge of the aforementioned handler 20, inside the aforementioned handler 20, a screw (not shown) is prepared in radial, and this screw is thrust into the slider (not shown) arranged free [ sliding in a stem 18 ]. The handler 20 and the slider are connected with one by this. The end face section of the operation wire 26 is fixed to the aforementioned slider, and the point of this operation wire 26 is connected with the forceps section 16.

[0008] The ring-like fingerplate section 28 is formed in the upper-limit section of the aforementioned stem 18. After inserting in a way person's thumb at the time of operation and inserting \*\*\*\*\* and the middle finger between the flange 22 of a handler 20, and a flange 24 in this state, a handler 20 pushes and length operation is carried out at this fingerplate section 28. Operation of a handler 20 operates the aforementioned forceps section 16 connected through the aforementioned slider and the operation wire 26.

[0009] The aforementioned hand control unit 12 is formed with the adhesion coiled spring 30 with which the periphery section has flexibility. The end face section of this adhesion coiled spring 30 has fixed in the soffit section of the aforementioned stem 18. The aforementioned

operation wire 26 is inserted in the interior of the adhesion coiled spring 30, and the point of the adhesion coiled spring 30 is joined to the forceps section main part 32 formed in the abbr aviation tubed which constitutes the forceps section 16.

[0010] As the aforementioned forceps section 16 is shown in drawing 2 and drawing 3, it has the slider 34 connected with the point of the operation wire 26, and links 38 and 40 are supported by this slider 34 free [ rotation ] through the pin 36. The pieces 46 and 48 of forceps formed in rough-elbowed are connected with the other end of these links 38 and 40 through pins 42 and 44. The aforementioned pieces 46 and 48 of forceps are supported to revolve by the forceps section main part 32 through the shaft 50 in the lap section. Therefore, switching operation of the pieces 46 and 48 of forceps of the aforementioned forceps section 16 is mutually rotated and carried out to an opposite direction a center [ a pin 50 ] by carrying out vertical movement of the handle 20 of drawing 1, and the operation wire's 26 pushing in or drawing-in operation being carried out.

[0011] The aforementioned pin 44 consists of flanges 52 prepared in the shank 54 and the edge of this shank 54, as shown in drawing 4. The aforementioned shank 54 consists of major-diameter section 54A and narrow diameter portion 54B, and a step 62 is formed in the peripheral face of a shank 54. the pin insertion to which, as for this shank 54, narrow diameter portion 54B was formed in the piece 46 of forceps — the pin insertion to which it was inserted in the hole 60 and major-diameter section 54A was formed in the link 40 — while being inserted in a hole 58, the aforementioned step 62 contacts the piece 46 of forceps, and the position of the piece 46 of forceps is regulated

[0012] Moreover, only d 1 is formed for a long time rather than thickness t1+t2 on which, as for the aforementioned pin 44, the length L1 put the link 40 and the piece 46 of forceps. concrete — the length L2 of major-diameter section 54A — pin insertion of a link 40 — only d 1 is formed for a long time rather than the length t3 of a hole 58 Thereby, between a link 40 and the piece 46 of forceps, predetermined crevice  $d1=L1-(t1+t2)$  is formed. The here predetermined crevice d1 is a suitable crevice in order to rotate a link 40 and the piece 46 of forceps, and in this example, it is set as about 0.02–0.05mm.

[0013] Next, an operation of the constituted bioptome 10 is explained like the above. A link 40 and the piece 46 of forceps are connected by caulking a pin 44. namely, the shank 54 of the aforementioned pin 44 — pin insertion of links 40 and 46 — insert in holes 58 and 60, make the flange 52 of a pin 44 contact the seat 41 of a link 40, the edge of a pin 44 is made to deform a pin 44 plastically in total, and the caulking section 66 of drawing 4 is formed It is connected free [ rotation by the pin 44 ] by this caulking through the crevice between a step 62, or predetermined [ the piece 46 of forceps to which the link 40 was fastened by closing and being fastened to the section 66 and predetermined ] in the piece 46 of forceps.

[0014] If the crevice between a link 40 and the piece 46 of forceps is too small at this time, a link 40 and the piece 46 of forceps will stick, and it will be hard coming to rotate. Conversely, if the crevice between a link 40 and the piece 46 of forceps is too large, a backlash will produce [ a plain-gauze cone ] rotation with a link 40 and the piece 46 of forceps between a link 40 and the piece 46 of forceps. On the other hand, in this example, since the crevice between sizes suitable between a link 40 and the piece 46 of forceps is formed, the rotation operability of the link 40 after caulking and the piece 46 of forceps is good.

[0015] Thus, according to the bioptome 10 of the gestalt of this operation, since the predetermined crevice was prepared between the link 40 and the piece 46 of forceps, the rotation operability of the link 40 after caulking and the piece 46 of forceps is good, and the secondary elaboration for raising the operability of a link 40 and the piece 46 of forceps becomes unnecessary. Therefore, a link 40 and the piece 46 of forceps can be connected, without applying time and effort.

[0016] Although the above is the connection structure of a link 40 and the piece 46 of forceps, and explanation about the operation, the connection structure of the link 38 and the piece 48 of forceps in a pin 42 can also be connected by constituting like the aforementioned connection structure, without applying time and effort. Moreover, it is good to constitute like the connection structure which also mentioned above the connection structure of links 38 and 40 and a slider

34. For example, as shown in drawing 5, the length L3 of the shank 72 of a pin 36 is formed for a long time than thickness  $t4+t5+t6$  which piled up links 38 and 40 and the slider 34. Moreover, form a step 70 in the shank 72 of a pin 36, this step 70 is made to contact a link 38, and the position of a link 38 is regulated. And the caulking section 68 is formed for a pin 36 in total, and predetermined crevice  $d2=L3-(t4+t5+t6)$  is formed between a link 38 and a slider 34. Thereby, the rotation operability of the links 38 and 40 to a slider 34 improves.

[0017] In addition, although the bioptome 10 was illustrated with the gestalt of operation mentioned above, it is not restricted to this, and it is applicable if it is the disposal implement for endoscopes with which the link connected free [ rotation ] by the pin is used.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

[Drawing 1] General drawing of the bioptome of the gestalt of this operation

[Drawing 2] Drawing of longitudinal section of the forceps section of the bioptome shown in drawing 1

[Drawing 3] The cross section which meets three to 3 line of the forceps section shown in drawing 2

[Drawing 4] Elements on larger scale of the pin shown in drawing 3

[Drawing 5] Explanatory drawing showing other examples

**[Description of Notations]**

10 [ — A link, 40 / — A link, 42 / — A pin, 44 / — A pin, 46 / — The piece of forceps, 48 / — The piece of forceps, 52 / — A flange, 54 / — A shank, 62 / — Step ] — A bioptome, 16 — The forceps section, 38

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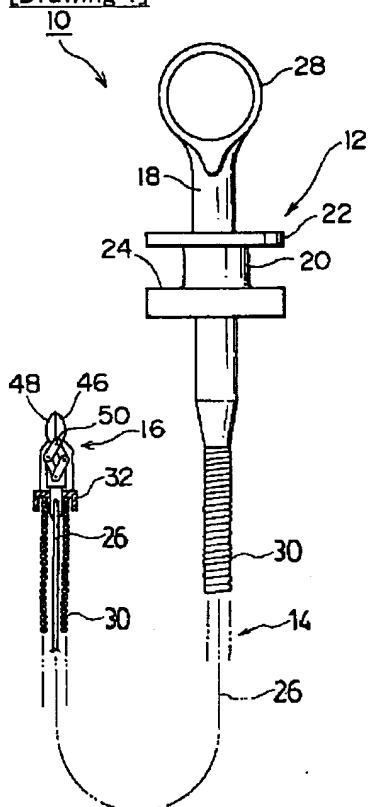
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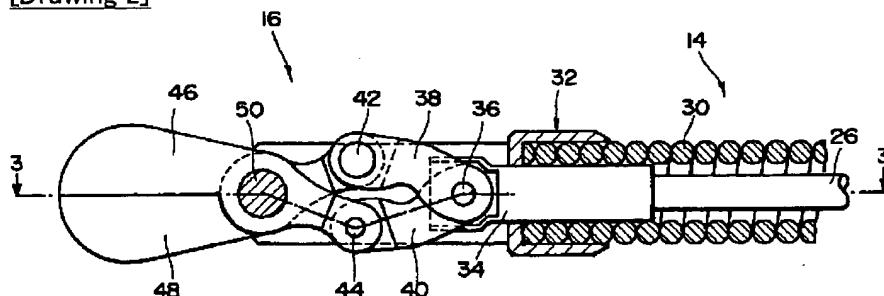
DRAWINGS

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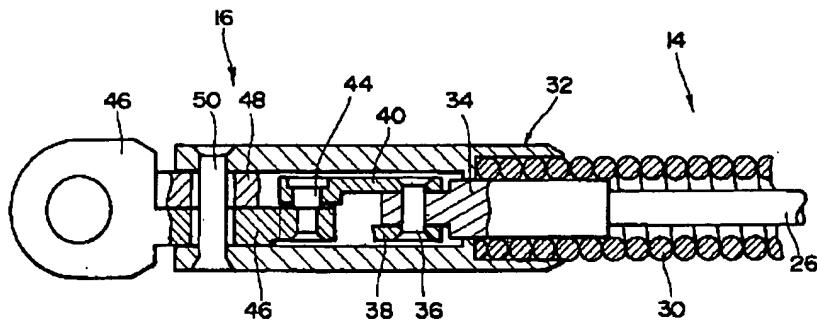
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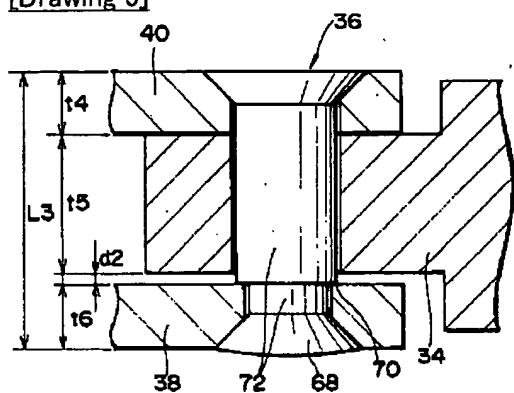
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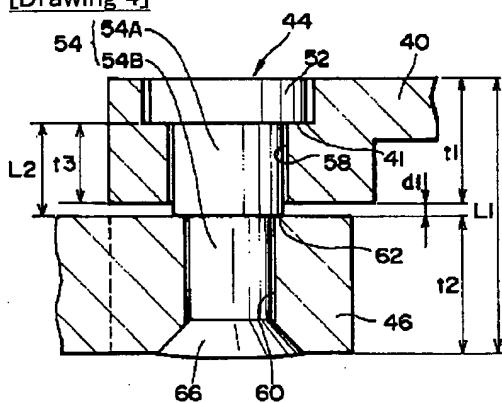
[Drawing 3]



[Drawing 5]



[Drawing 4]



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[Translation done.]